Name: Date:

Polynomial Factoring solution (version 18)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-32}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{8 \pm 4\sqrt{2}\, i}{2}$$

$$x = 4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 - 5i$ and $3 - 2i$ in standard form $(a + bi)$.**

Solution

$$(9 - 5i) \cdot (3 - 2i)$$

$$27 - 18i - 15i + 10i^2$$

$$27 - 18i - 15i - 10$$

$$27 - 10 - 18i - 15i$$

$$17 - 33i$$

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3. **Write function $f(x) = x^3 - 8x^2 + 9x + 18$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-8	9	18
6		6	-12	-18
	1	-2	-3	0

$$f(x) = (x-6)(x^2 - 2x - 3)$$

$$f(x) = (x-6)(x-3)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-1) \cdot (x-5) \cdot (x-8)^2$$

Sketch a graph of polynomial $y = p(x)$.